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Chapter 10 Process/Requirements for the SMA Portions of Requests for Liability Insurance or Indemnification of EAV Developers

10.1 Introduction

10.1.1 This chapter is applicable to the safety review process when the developer of an EAV, involved in an agreement with NASA, has requested liability insurance or indemnification.

10.1.2 An EAV is defined by 42 U.S.C. S 2458c, Section 309 of the National Aeronautics and Space Act of 1958, as amended. Section 309(d)(3) defines an EAV as: "an object intended to be flown in, or launched into, orbital or suborbital flight for the purpose of demonstrating technologies necessary for a reusable launch vehicle, developed under an agreement between the Administration and a developer."

10.1.3 Section 309 specifies that the NASA Administrator may provide liability insurance or indemnification for a NASA EAV developer [defined in Section 309(d)(2)] for liability to third parties arising from the operation of an EAV [defined in Sections 308 and 309(b)(2)].

10.1.4 Among other prerequisites for the NASA Administrator to grant liability insurance or indemnification per 42 U.S.C. S 2458c, the developer "establishes to the satisfaction of the Administrator that appropriate safety procedures and practices are being followed

in the development of the EAV" [Section 309(b)(2)(D)].

10.1.5 This chapter defines the NASA safety review required to implement Section 309 (b)(2)(D) as a prerequisite to the NASA Administrator's approval of requests for providing liability insurance or indemnification in accordance with 42 U.S.C. S 2458c.

Note: The process and documentation described in this chapter represent the widest range of reviews needed by NASA to understand the risk and decide to indemnify the flight of an EAV. Based on the scope of the request received from the developer of an EAV and the maturity and complexity of the systems involved, the Chief, Safety and Mission Assurance, may tailor the scope of the reviews needed to assure the Administrator that adequate safety assessments have been performed, and the risks to a third party for death, bodily injury, property damage, or loss resulting from an activity carried out in connection with the development or use of an EAV and to the United States Government for damage or loss to Government property resulting from such an activity are mitigated to an acceptable level.

10.2 Responsibility

10.2.1 The Chief, Safety and Mission Assurance, shall:

- a. Oversee the process for evaluating the safety review portion of any requests made for liability insurance or indemnification (Requirement).
- b. Provide the NASA Administrator or delegee with an evaluation of the safety procedures and practices associated with a request for liability insurance or indemnification (Requirement).
- c. Provide the cognizant Mission Directorate Associate Administrator with a listing of the documentation needed to perform a safety review of the request for liability insurance or indemnification (see paragraph 10.3.2) (Requirement).

10.2.1.1 The Chief, Safety and Mission Assurance, may designate, in writing, a NASA management official to represent NASA SMA at EAV reviews. The designee shall keep the Chief, Safety and Mission Assurance, apprised of all SMA issues and actions ([Requirement 21020](#)).

10.2.2 The cognizant Mission Directorate Associate Administrator shall:

10.2.2.1 Coordinate the processing of requests for liability insurance or indemnification made to the NASA Administrator or delegee.

10.2.2.2 Obtain the concurrence of the Chief, Safety and Mission Assurance, the NASA General Counsel, the NASA Chief Engineer, and the NASA Chief Financial Officer prior to submission of the request for liability insurance or indemnification to the NASA Administrator or delegee for approval ([Requirement 2007](#)).

10.2.2.3 Ensure that the Chief, Safety and Mission Assurance, is provided full access to all safety documentation related to the request for liability insurance or indemnification (Requirement) (see paragraph 10.3.2).

10.2.3 The NASA General Counsel shall interpret and certify that requests for liability insurance or indemnification for EAV developers are processed in accordance with

applicable laws, regulations, and policies. ([Requirement 2008](#)).

10.2.4 The overall lead EAV program/project Center's SMA Director shall assure that the required safety procedures and practices are being followed in the development of the EAV and ensure that adequate records are maintained to support the safety reviews associated with any decision on liability insurance or indemnification (Requirement).

10.2.5 The EAV program/project manager shall collect and certify as accurate the safety review material provided to the Chief, Safety Mission Assurance, as part of a request for liability insurance or indemnification ([Requirement 2024](#)).

10.2.6 The contracting officer, grants officer, or other designated NASA official shall ensure that EAV funding instruments include procedures and requirements for safety reviews needed with requests for liability insurance or indemnification (Requirement).

10.2.7 The NASA Chief Engineer shall review requests for liability insurance or indemnification for compliance to NASA engineering practices and provide comments to the Chief, Safety and Mission Assurance, and the Mission Directorate Associate Administrator (Requirement).

10.3 EAV SMA Assessment Reviews

10.3.1 Safety and Mission Success Reviews, as defined in NPR 8705.6, Safety and Mission Assurance Audits, Reviews, and Assessments, shall be performed at the following times, at a minimum, during a request for liability insurance or indemnification of an EAV (Requirement):

- a. Within one month of the request being officially submitted.
- b. A minimum of one month prior to any decision meeting with the NASA Administrator on granting liability insurance or indemnification.
- c. A minimum of three weeks prior to each EAV flight where liability insurance or indemnification has been granted.

10.3.2 The overall lead EAV program/project manager, with the Center SMA Director, shall present the following safety materials nominally required as a part of a program compliant with NPD 7120.4, Program/Project Management, and NPD 8700.1, NASA Policy for Safety and Mission Success, and the subordinate documents, at the Safety and Mission Success Review as a minimum (Requirement):

- a. Program/project safety or SMA plan(s) implementation (e.g., system safety plan, quality assurance plan, test/mission plan, risk assessment/management plan, hardware/software assurance plan, independent verification and validation plan, emergency/contingency plan(s), and environmental management plans).
- b. Results of as-built reviews.
- c. The adequacy of the SMA processes to cover all facets of the program.
- d. Risk identification, risk management, and risk tradeoffs.
- e. Safety and hazard risk identification/analyses (including NEPA documentation) and how the risks are closed/mitigated/tracked.
- f. Prioritization of the above risk items as to their criticality.

- g. The method for reviewing SMA provisions of external interfaces (e.g., system safety working group, Space Shuttle/International Space Station program, Ground Safety Review Panel, range, international partners/participants).
- h. Review of demonstrated and documented compliance with applicable range safety requirements.
- i. Any required probabilistic risk assessment(s) for the EAV.

10.3.3 For EAV program-wide or EAV preflight reviews being held after the Safety and Mission Success Review discussed in paragraph 10.3.1.c, the Mission Directorate Associate Administrator shall ensure that the Chief, Safety and Mission Assurance (or designee), is invited to participate in the reviews ([Requirement 21039](#)).

10.3.4 For EAV flights which are performed outside of established U.S. ranges, the EAV program/project manager shall invite any ranges involved in the EAV flight to participate in the safety review process defined in this chapter ([Requirement 21069](#)).

10.4 SMA Review Process Products

10.4.1 Upon completion of each Safety and Mission Success Review, the Chief, Safety and Mission Assurance (and/or designee), shall issue an initial assessment of the EAV program/project's SMA process(es) to the applicable Mission Directorate Associate Administrator. The assessment shall include (Requirement):

- a. A preliminary assessment of whether the developer is following appropriate safety procedures and practices in the development of the EAV.
- b. Recommendations for corrections or additions to the program/project SMA planning.
- c. Requests for further actions or information along with a written response to the assessment.

10.4.2 The Mission Directorate Associate Administrator shall ensure that the results of the safety review are included in the package submitted to the Administrator or delegee for review and decision regarding the request for liability insurance or indemnification (Requirement).

10.4.3 The Chief, Safety and Mission Assurance, shall maintain a record of the safety reviews associated with any request for liability insurance or indemnification per NPD 1441.1, NASA Records Retention Schedules, for a minimum of ten years beyond the life of the EAV program/project (Requirement).

10.5 Range Safety Requirements

(Note: The following two basic program/project requirements are summarized from 14 CFR Chapter III (FAA) and the range safety requirement documents (i.e., EWR 127-1). These requirements are not to be considered as all-inclusive but are provided to assist the program/project manager in understanding which fundamental requirements must be met. These requirements form the basis for developing an acceptable safety risk mitigation plan for EAV projects.)

10.5.1 Operations

The EAV operator should use a structured analytical approach in preplanning for orbital, suborbital, and entry flight by developing detailed flight rules, procedures, and checklists prior to the Flight Readiness Review, for both nominal and contingency operations. The EAV operator shall document scenarios that allow for continued safe flight and landing or flight termination in a manner that minimizes risk in off-nominal situations ([Requirement 21109](#)).

10.5.2 Notification

The EAV operator shall coordinate, develop procedures, and demonstrate (in conjunction with the host range and/or FAA), prior to launch and reentry, the capability to notify maritime and aviation authorities with sufficient time to clear the trajectory, ground-track, and emergency abort areas (if applicable) of traffic ([Requirement 21111](#)).

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